

## PUBLICATIONS OF XIAO XIONG ZHOU

*Medivir AB, Lunastigen 7, 141 44 Huddinge, Sweden*

1. The synthesis of E coR I substrate analogues and their interaction with the enzyme.  
Tang, J-Y., Zhou, X-X., Zhou, B-Y., and Chen, C-Q., *Acta Biochim. Biophys. Sinica.*, **14**, 337 ( 1982 )
2. Synthesis of a nonaribonucleotide corresponding to sequence of 14-22 of yeast alanine transfer RNA.  
Tang, J-Y., Lian, Z-H., Zhou, X-X., Chen, C-Q., and Wang, D., *Acta Biochim. Biophys. Sinica.*, **15**, 73 ( 1983 ).
3. Synthesis of Leu-enkephalin gene. Synthesis of d-GATCCTAGA.  
Zhou, X-X., Chen, C-Q., and Wang, D., *Acta Biochim. Biophys. Sinica.*, **15**, 159 (1983)
4. Total synthesis of Leu-enkephalin gene.  
Tang, J-Y., Zhou, X-X., Lian, Z-H., Yang, X-Y., Chen, C-Q., and Wang, D., *Scientia Sinica, Series B*, **27**, 466 ( 1985 ).
5. Cloning and expression of the synthetic Leu-enkephalin gene in E.coli.  
Ao, S-Z., Lian, Z-H., Tang, J-Y., Ding, X-H., Zhou, X-X., Chen, C-Q., and Li, Z-P., *Scientia Sinica, Series B*, **27**, 28 ( 1985 ).
6. A rapid solid phase phosphotriester method for DNA synthesis.  
Zhou, X-X., Lian, Z-H., and Chen, C-Q., *Acta Biochim. Biophys. Sinica.*, **17**, 155 ( 1985 ).
7. Chemical synthesis of fused glucagon enkephalin gene fragments.  
Qi, Z.H., Zhou, X-X., Chen, C-Q., and Wang, D., *Acta Biochim. Biophys. Sinica*, **17**, 450 ( 1985 ).
8. A convenient preparation of N-protected nucleosides with 2,2,2-trichloro-t-butyloxy-carbonyl (TCBOC) group. Structural assignment of N,N-bis-TCBOC guanosine and its 2'-deoxy analogues.  
Zhou, X-X., Ugi, I., and Chattopadhyaya, J., *Acta Chem. Scand.*, **B39**, 761 ( 1985 ).
9. Some observations on the <sup>13</sup>C-NMR assignments of the pentafuranose moiety of D-nucleosides.  
Bazin, H., Zhou, X-X., Welch, C.J., Pathak, T., Nyilas, A., and Chattopadhyaya, J., *Chemica Scripta*, **26**, 17 ( 1986 ).
10. A convenient preparation of 2-N-(4-t-butylbenzoyl)-6-O-(2-nitrophenyl)guanosine and its application in the synthesis of 5'(GpGpGpU)3' constituting the 3'-anticodon stem of E. coli tRNA<sup>lle</sup>.  
Zhou, X-X., Sandström, A., and Chattopadhyaya, J., *Chemica Scripta*, **26**, 241 (1986 )

11. New Phosphorylating reagents and protecting group techniques for oligonucleotides synthesis, as well as computer assistance in the design of reagents.  
Ugi, I., Bauer, J., Fontain, E., Götz, J., Hering, G., Jakob, P., Landgraf, Karl, R., Lehmen, P., Schneiderwind, R., Schwarz, R., Sluka, P., Balgobin, N., Pathak, T., Zhou, X-X., and Chattopadhyaya, J., *Chemica Scripta*, **26**, 205 ( 1986 )
12. Pyridyl groups for protection of the imide functions of uridine and guanosine. Exploration of their displacement reactions for site-specific modifications of uracil and guanine bases.  
Zhou, X-X., Welch, C.J., and Chattopadhyaya, J., *Acta Chem. Scand.*, **B40**, 806 (1986)
13. Synthesis of an mRNA fragment of alanyl-tRNA synthetase gene in E. coli using 6-methyl-3-pyridyl group for protection of the imide functions of uridine and guanosine.  
Welch, C.J., Zhou, X-X., and Chattopadhyaya, J., *Acta Chem Scand.* **B40**, 817 (1986)
14. An assessment of the reactivity of guanosine and some of its derivatives to electrophiles by  $^{15}\text{N}$ -NMR spectroscopy.  
Remaud, G., Zhou, X-X., Welch, C.J., and Chattopadhyaya, J., *Tetrahedron*, **42**, 4057 ( 1986 )
15. Site-specific modification of pyrimidine residue during the deprotection of the fully-protected diuridilic acid.  
Zhou, X-X., and Chattopadhyaya, J., *Tetrahedron*, **42**, 5149 ( 1986 ).
16. Some aspects of reactivity and protection of the imide functions of uridine and guanosine in nuclei acid synthesis.  
Welch, C.J., Zhou, X-X., Nyilas, A., Remaud, G., and Chattopadhyaya, in "Biophosphates and their Analogues, Synthesis, Structure, Metabolism and Activity" ed. Bruzik, K.S., and Stec, W.J., Elsevier, Amsterdam, p.107 ( 1987 ).
17. Acid hydrolysis of 6-substituted 9-(2'-deoxy-D-erythro-pentafuranosyl)purine and their 9- (alkoxyethyl) counterparts: kinetics and mechanism.  
Oivanen, Lönnberg, H., Zhou, X-X., and Chattopadhyaya, *Tetrahedron*, **43**, 1133 ( 1987 ).
18. An assessment of electronic properties of pyrimidine and purine nucleosides by  $^{15}\text{N}$ -NMR spectroscopy.  
Remaud, G., Welch, C.J., Zhou, X-X., and Chattopadhyaya, J., *Nucleosides & Nucleotides*, **7**, 167 ( 1988 ).
19. The effect of protecting groups of the nucleobase and sugar moieties on the acidic hydrolysis of glycosidic bond of 2'-deoxyadenosine: akinetic and  $^{15}\text{N}$ -NMR spectroscopic study.  
Remaud, G., Zhou, X-X., Oivanen, M., Lönnberg, H., and Chattopadhyaya, J., *Teirahedron*, **43**, 4453 ( 1987 ).

20. An efficient synthesis of Y-nucleoside (wyosine) by regiospecific methylation of N<sup>4</sup>-desmethylwyosine using organozinc reagent.  
Bazin, H., Zhou, X-X., Glemarec, C. and Chattopadhyaya, J., *Tetrahedron Lett.* **28**, 3275 ( 1987 ).
21. A versatile strategy for the O<sup>4</sup>-protection and modification of the lactam function of uridine and uridylic acid.  
Nyilas, A., Zhou, X-X., Welch, C.J. and Chattopadhyaya, J., *Nucleic Acid Res. Symposium Series*, No.18, 157 ( 1987 ).
22. A regiospecific synthesis of branched tetranucleotides, U3'p5'A<sup>2'p5'G</sup><sub>3'p5'U</sub> and U3'p5'A<sup>2'p5'G</sup><sub>3'p5'C</sub>  
Zhou, X-X., Nyilas, A. and Chattopadhyaya, J., *Nucleic Acid Res. Symposium Series*, No. 18, 93 ( 1987 ).
23. The application of 15N-NMR spectroscopy in the problems of nucleoside and nucleotide chemistry.  
Remaud, G, Zhou, X-X., Welch, C.J., and Chattopadhyaya, J., *Nucleic Acid Res. Symposium Series*, No. 18, 169 ( 1987 ).
24. The <sup>15</sup>N-NMR Spectroscopic studies of Wyosine-triacetate and its 7-methyl congener in neutral and acidic solution.  
Glemarec, C., Remaud, G., Bazin, H., Zhou, X-X., and Chattopadhyaya, J., *Nucleic Acid Res. Symposium Series*, No. 18, 73 ( 1987 ).
25. Regiospecific synthesis of branched tetranucleotides, A3'p5'A<sup>2'p5'G</sup><sub>3'p5'U</sub>, A3'p5'A<sup>2'p5'G</sup><sub>3'p5'C</sub>, U3'p5'A<sup>2'p5'G</sup><sub>3'p5'U</sub> and U3'p5'A<sup>2'p5'G</sup><sub>3'p5'C</sub>  
Zhou, X-X., Nyilas, A., Remaud, G., and Chattopadhyaya, J., *Tetrahedron*, **43**, 4685 ( 1987 ).
26. The influence of N<sup>6</sup>-protecting groups on acid-catalyzed depurination of 2'-deoxyadenosine.  
Remaud, G, Zhou, X-X., Chattopadhyaya, Oivanen, M., and Lönnberg, H., *Nucleic Acid Res.*, Symposium Series No. 18, 145, ( 1987 ).
27. 270 MHz 1H-NMR studies of four branched tetranucleotides A3'p5'A<sup>2'p5'G</sup><sub>3'p5'U</sub>, A3'p5'A<sup>2'p5'G</sup><sub>3'p5'C</sub>, U3'p5'A<sup>2'p5'G</sup><sub>3'p5'U</sub> and U3'p5'A<sup>2'p5'G</sup><sub>3'p5'C</sub> which are formed as the lariat branch-point in pre-mRNA processing reactions ( splicing ).  
Zhou, X-X., Nyilas, A., Remaud, G., and Chattopadhyaya, J., *Tetrahedron*, **44**, 571 ( 1988 ).
28. Synthesis and conformation of 2'- 5' and 3'- 5' phosphodiester linked " branched " triadenylates A<sup>2'p5'A</sup><sub>3'p5'A</sub>.  
Remaud, G., Zhou, X-X., Öberg, B., and Chattopadhyaya J., in " *Reviews of Heteroatom Chemistry* " Vol. 1 Ed. S. Oae, MY Publishing Inc, Tokyo, 340 ( 1988 )
29. Temperature-dependent 31P-NMR shifts to assess the conformations of branched tri-tetra-nucleotides which are formed as lariats in the splicing reactions.  
Sandström, A., Remaud, G., Vial, J-M., Zhou, X-X., Nyilas, A., Balgobin, N., and

Chattopadhyaya, J., *J. Chem. Soc., Chem. Comm.*, 542 ( 1988 ).

30. Conformations of lariat structures formed in the splicing of pre-mRNA by NMR spectroscopy.  
Sandström, A., Balgobin, N., Nyilas, A., Remaud, G., Vial, J-M., Zhou, X-X., and Chattopadhyaya, J., *Nucleosides & Nucleotides*, 7, 787 ( 1988 ).
31. Kinetic and mechanism for the acidic hydrolysis of purine 2'- deoxyribonucleosides and their analogues.  
Oivanen, M., Zhou, X-X., Chattopadhyaya, J., and Lönnberg, H., *Finnish Chem. Lett.*, 14, 141 ( 1987 ).
32. (7H)adenine is a better leaving group than its ( 1H) isomer in the hydrolysis of purine nucleosides.  
Remaud, G., Zhou, X-X., Chattopadhyaya, J., Oivanen, M., and Lönnberg, H., *Finnish Chem. Lett.*, 14, 143, ( 1987 ).
33. New regiospecific synthesis of the branched tri-, penta-, & hepta-ribonucleic acids which are formed as the lariat in pre-mRNA processing reactions.  
Zhou, X-X., Remaud, G., and Chattopadhyaya, *Tetrahedron*, 44, 6471 ( 1988 ).
34. Why do all lariat RNA introns have adenosine as the branch-point nucleotide? Conformational study of naturally-occurring branched trinucleotides and its eleven analogues by  $^1\text{H}$ -,  $^{31}\text{P}$ -NMR and CD spectroscopy.  
Remaud, G., Balgobin, N., Sandström, A., Koole, L.H., Drake, A.F., Vial, J-M., Zhou, X-X., Buck, H.M., and Chattopadhyaya, J., *J. Biochem. & Biophys. Methods*, 18, 1, ( 1989 ).
35. Synthesis of branched oligonucleotides ( Lariat ).  
Balgobin, N., Zhou, X-X., Vial, J-M., Nyilas, A., Földesi, A., and Chattopadhyaya, J., *Nucleosides & Nucleotides*, 8, 793 ( 1989 ).
36. A comparative high-field NMR study of branched tri-, tetra-, penta-, and heptamer ribonucleotides modelling the branch site of Group II and nuclear messenger RNA spliced lariat introns.  
Koole, L.H., Remaud, G., Zhou, X-X., Buck, H.M., and Chattopadhyaya, J., *J. Chem. Soc., Chem. Comm.*, 859 ( 1989 ).
37. Synthetic and High-field NMR study of branched tri, penta and heptaribonucleotides modelling the lariat-intron in Group II splicing.  
Zhou, X-X., Vial, J-M., Sandström, A., Remaud, G., Koole, L.H., and Chattopadhyaya, J., *Nucleic Acid Res. Symposium Ser.*, No 21, 127 ( 1989 ).
38. Why does an intron form a lariat before the ligation of 5'- and 3'-exons in group II and nuclear mRNA splicing? Conformations of branched ribonucleotides modeling the lariat intron.  
Remaud, G., Vial, J.M., Balgobin, N., Koole, L.H., Sandtröm, A., Drake, A.F., Zhou, X.X., Glemarec, C., Chattopadhyaya, J., *Struct. Methods, Proc. Conversation Discip. Biomet. Stereodyn.*, 6 th ( 1990 ), 3, 319, Ed. Sarma, R., Adenine Press. N.Y.

10015134-11501

39. Solution Structure of Pentameric and Heptameric Branched-RNA modeling the Lariat Structure of Group II or nuclear m-RNA Introns Studied by One- and Two-dimensional NMR Spectroscopy at 500 MHz.  
Koole, L.H., Agback, P., Glemarec, C., Zhou, X.X., Chattopadhyaya, J., *Tetrahedron*, **47**, 3183, (1991).
40. Phenethylthiazolethiourea (PETT) compounds, a new class of HIV-1 reverse transcriptase inhibitors. 1. Synthesis and basic structure-activity relationship studies of PETT analogs.  
Bell, F.W., Cantrell, A.S., Hogberg, M., Jaskunas, S.R., Johansson, N.G., Jordan, C.L., Kinnick, M.D., Lind, P., Morin, J.M., Noreen, R., Oberg, B., Palkowitz, J.A., Parrish, C.A., Pranc, P., Sahlberg, C., Swanson, S., Ternansky, R.L., Unge, T., Vasileff, R.T., Vrang, L., West, S.J., Zhang, H., Zhou, X-X., *J. Med. Chem.*, **38**, 4929, (1995)
41. The PETT series, a new class of potent nonnucleoside inhibitors of human immunodeficiency virus type 1 reverse transcriptase.  
Ahgren, C Backro, K, Bell, F.W., Cantrell, A.S., Clemens, M., Colacino, J.M., Deeter, J.B., Engelhardt, J.A., Hogberg, M., Jaskunas, S.R., Johansson, N.G., Jordan, C.L., Kashner, J.S., Kinnick, M.D., Lind, P., Lopez, C., Morin, J.M., Muesing, M.A., Noreen, R., Oberg, B., Paget, C.J., Palkowitz, J.A., Parrish, C.A., Pranc, P., Rippey, M.K., Rydergard, C., Sahlberg, C., Swanson, S., Ternansky, R.L., Unge, T., Vasileff, R.T., Vrang, L., West, S.J., Zhang, H., Zhou, X-X., *Antimicrob. Agents Chemother.*, **39**, 1329, (1995).
42. Patent Application SE9604179-3,  
Zhou, Xiao Xiong, Öberg, Bo, Myhren, Finn and Börretzen, Bernt,
43. Patent Application SE96025663,  
Zhou, Xiao Xiong, Öberg, Bo, Myhren, Finn and Börretzen, Bernt.
44. Distribution to the brain and protein binding of 3' and 5-substituted 2', 3'-dideoxyuridine derivatives, studied by microdialysis.  
Borg, N. Zhou, X.X., Öberg, B., Stahle, L., *Antiviral Chem. Chemother.* **8**, 47 (1997).
45. WO97/30051  
Engelhardt, Per, Högberg, Marita, Zhou, Xiao Xiong, Lindborg, Björn and Johansson, Nils Gunnar.
46. WO97/30052  
Engelhardt, Per, Högberg, Marita, Zhou, Xiao Xiong, Lindborg, Björn and Johansson, Nils Gunnar.
47. WO 9821223 A1 19980522  
Zhou, Xiao-Xiong; Johansson, Nils-Gunnar.
48. WO 9909031 A1 19990225  
Zhou, Xiao-Xiong; Johansson, Nils-Gunnar; Wahling, Horst.

49. WO 9941268 A1 19990819

Wahling, Horst; Zhou, Xiao-xiong.

50. WO 9941275 A1 19990819

Johansson, Nils Gunnar; Zhou, Xiao-xiong; Wahling, Horst; Sund, Christian; Wahlberg, Hans; Salvador, Lourdes; Lindstrom, Stefan.

51. WO 9951613 A1 19991014

Zhou, Xiao-xiong; Johansson, Nils Gunnar; Wahling, Horst; Sund, Christian; Wallberg, Hans; Salvador, Lourdes; Lindstrom, Stefan.

52. Inhibition of human immunodeficiency virus by 3'-fluoro-2', 3'-  
dideoxy-guanosine (FLG)

Zhang, Hong, Vrang, Lotta, Zhou, Xiao Xiong, Johansson, Nils-Gunnar and Öberg, Bo.  
*Antiviral Chemistry & Chemotherapy*. Submitted

10015184-11601